Sesia himachalensis sp. n. and *Sesia ladakhensis* Špatenka 1990 comb. rev. from the Indian Himalaya (Lepidoptera: Sesiidae, Sesiinae)

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Abstract: The centre of distribution of the genus *Sesia* Fabricius, 1775 lies in the Central and East Asian mountains. Here we describe another species, *Sesia* ***himachalensis*** **sp. n.** (holotype male in Museum Witt, Munich, Germany; will later go to Zoologische Staatssammlungen, Munich) from Himachal Pradesh (Lahaul and Spiti) in northern India. The new species is closely related to *Sesia sininggensis* (Hsu, 1981) from Xining, China, and *Sesia tibetensis* Arita & Xu, 1994 from Tibet. It differs from both species in details of the body markings as well as the male genitalia. The female is unknown. Furthermore, the male genitalia of *Sesia ladakhensis* Špatenka, 1990 **comb. rev.** are illustrated for the first time, its taxonomic position is discussed and the species is transferred from *Dasysphecia* Hampson, 1919 to *Sesia* Fabricius, 1775.

***Sesia himachalensis* sp. n. und *Sesia ladakhensis* Špatenka 1990 comb. rev. aus dem indischen Himalaya (Lepidoptera: Sesiidae, Sesiinae)**

Zusammenfassung: Die Gattung *Sesia* Fabricius, 1775 hat ihr Verbeitungszentrum in den Gebirgen Zentral- und Ostasiens. Hier wird eine weitere Art, *Sesia* ***himachalensis*** **sp. n.** (Holotypus Männchen in CMWM, später in ZSM), aus Himachal Pradesh (Lahaul und Spiti) in Nordindien beschrieben, die nahe mit *Sesia siningensis* (Hsu, 1981) aus Xining, China, und *Sesia tibetensis* Arita & Xu, 1994 aus Tibet verwandt ist. Die neue Art unterscheidet sich von beiden Arten durch charakteristische Merkmale der Körperzeichnung und des männlichen Genitals. Das Weibchen ist unbekannt. Des weiteren werden erstmals die männlichen Genitalstrukturen von *Sesia ladakhensis* Špatenka, 1990 **comb. rev.** abgebildet und die systematische Stellung der Art diskutiert. Die Art wird von *Dasysphecia* Hampson, 1919 wieder in die Gattung *Sesia* Fabricius, 1775 transferiert.

Introduction

The genus *Sesia* Fabricius, 1775 belongs to the tribe Sesiini Boisduval, 1828 and comprises some of the biggest and most striking clearwing moths in the Palaearctic region. The larvae of most *Sesia* utilize various species of *Populus* as a host plants although some feed in *Salix* stems, both of the family Salicaceae. Only 3 species, *S. apiformis* (Clerck, 1759), *S. bembeciformis* (Hübner, [1806]) and *S. melanocephala* Dalman, 1816 occur in the Western Palaearctic and only 2 species have been found in North America (Eichlin & Taft 1988). The majority of species occur in Central Asia and in particular in the Himalaya and Eastern Asia. Including the species dealt with in this study, 18 species are known from this region (Špatenka et al. 1999, Pühringer & Kallies 2004) and undoubtedly others remain to be discovered. We here describe a new species, *Sesia himachalensis* **sp. n.,** from Himachal Pradesh and Spiti, northern India, and figure the ♂ genitalia of *Sesia ladakhensis* Špatenka, 1990 **comb. rev.** for the first time. Both species were collected with the help of artificial pheromone lures (standard lures PATA, PEHY, SEAP, SYMY, SYFO, SYVE, SYTI and MECU of Pherobank Plant Research International, Wageningen, NL).

Abbreviations

CAK Collection A. Kallies, Schwerin, Germany.

CDF Collection J. J. de Freina, Munich, Germany.

CMWM Entomologisches Museum Witt, Munich, Germany.

SMFL Senckenberg-Museum, Lepidoptera collection, Frankfurt am Main, Germany.

SMNS Staatliches Museum für Naturkunde Stuttgart, Germany.

ZSM Zoologische Staatssammlungen, Munich, Germany.

Sesia himachalensis sp. n.

(Figs. 1, 2, 7)

Holotype ♂: [India], Nordindischer Himalaja, Himachal Pradesh, Lahaul, Chandra-Tal, 5 km ESE Gondla, Rauling, 3150 m, 18.–22. vii. 1998, leg. et coll. CDF, in CMWM (Fig. 2).

Paratypes (in total 4 ♂♂): 1 ♂, same data as holotype, leg. et coll. CDF. 1 ♂, Nordindischer Himalaja, Himachal Pradesh, Lahaul, Chandra-Tal, 3 km NW Gondla, Tiling, 3050 m, 21. vii. [19]98, leg. et coll. CDF. 1 ♂, Nordindischer Himalaja, Himachal Pradesh, Spiti, Spiti-Tal, ca. 8 km SW Tabo, Poh, 3200 m, 30. vii. 1998, leg. et coll. CDF. 1 ♂ (Figs. 1, 7), India N, Himachal Pradesh, Spiti, Spiti valley, 7 km SE Kaza, 4150 m, 3. viii. 1994 Ph., leg. P. Kautt & V. Weisz, genitalia on slide ♂AK53 (CAK).

Etymology. The new species is named after its origin.

Description. Alar expanse 36.5–39.0 mm (holotype 37.0 mm); length of forewing 16.5–18.0 mm.

Head. Brown, with pale yellow hair dorsally; frons deep yellow laterally; antenna brown, scape yellow ventrally; labial palps yellow, dirty orange basally.

Wings. Forewings and hindwings transparent throughout, costal and anal margins and veins brown with some yellow scales.

Thorax. Patagia deep yellow; with tufts of hair-like yellow scales dorso-laterally; metathorax with similar yellow scales; yellow scales under the forewings.

Abdomen. Brownish, tergite 3 with distinct pale yellow band proximally, tergite 4 with a similar but less distinct and darker band, tergite 5 with some dirty yellow scales; tergites 6 and 7 yellow proximally; sternites 3–7 with distinct, pale yellow proximal bands; anal tuft dirty yellow.

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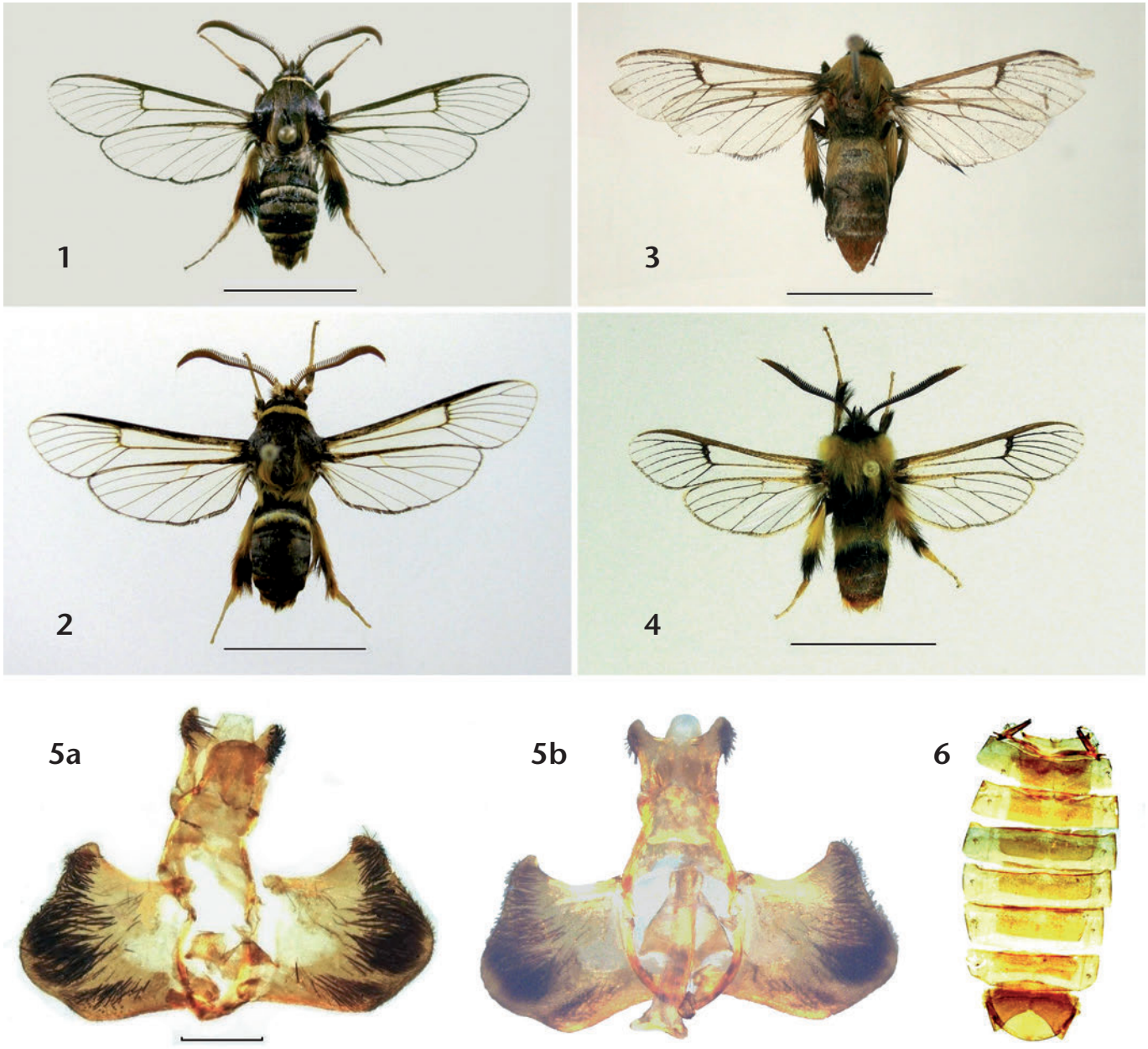

Figs. 1–2: *Sesia himachalensis* sp. n. **Fig. 1:** Paratype ♂, India N, Himachal Pradesh, Spiti, Spiti valley, 7 km SE Kaza, 4150 m, 3. VIII. 1994 Ph., leg. P. KAUTT & V. WEISZ. **Fig. 2:** Holotype ♂. — **Figs. 3–6:** *Sesia ladakhensis* ŠPATENKA, 1990. **Fig. 3:** Holotype ♀, India, Ladakh, Kargil, Bewässerungsanlagen, 2950 m, 30. V.–7. VI. 1976, leg. MARTENS & SCHAWALLER, in SMFL. **Fig. 4:** ♂, Nordindischer Himalaja, Himachal Pradesh, Lahaul, Chandra-Tal, 5 km ESE Gondla, Rauling, 3150 m, 18.–22. VII. 1998, leg. DE FREINA. **Fig. 5:** ♂ genitalia (same data as Fig. 4, prep. CMWM, Heterocera 13797); **a:** Genitalia ventral view, phallus removed; **b:** Genitalia, view from dorsal side, phallus in natural position, photographed in fluidum, slightly flattened. **Fig. 6:** Abdominal segments (ventral view) with characteristic structures of 8th sternite/tergite. — Scales Figs. 1–4 = 10 mm (specimens not exactly to the same scale); Fig. 5a = 1 mm.

Legs. Fore coxa brown, dirty orange laterally; foretibia dorsally brown, ventrally orange-yellow; foretarsus yellow; forefemur brown, mixed with orange. Mid- and hindfemur brown along posterior/ventral margins, pale yellow along anterior/dorsal margins; mid- and hindcoxae pale yellow to white; mid- and hindtibiae dirty yellow to brown, orange dorsally; hind leg with tibial scale tuft yellow proximally, dark brown distally, with orange scales externally; mid- and hindtarsus yellow to orange.

Diagnosis. This species is similar and closely related to *Sesia tibetensis* ARITA & XU, 1994, *Sesia siningensis* (HSU, 1981) and *Sesia gloriosa* (LE CERF, 1914), all of which are known from Tibet or neighbouring Xining, China.

S. himachalensis differs from *S. tibetensis* and *S. siningensis* as follows: thorax with yellow scales dorso-medially (black in *S. tibetensis*); tergite 4 yellow to yellowish brown in proximal half (black in *S. tibetensis*; brown in *S. siningensis*); forecoxa yellow brown to pale yellow (black in *S. tibetensis*; brown in *S. siningensis*); hindcoxa white (dark in *S. tibetensis*); hindtibia dorsally black to brown in the distal two thirds (brown to yellow orange in the distal half in *S. siningensis*); base of costal margin of forewing without yellow spot (with yellow spot in *S. siningensis*, without in *S. tibetensis*); tergite 2 fuscous-brownish (black in *S. tibetensis*); basal segment of labial palpus

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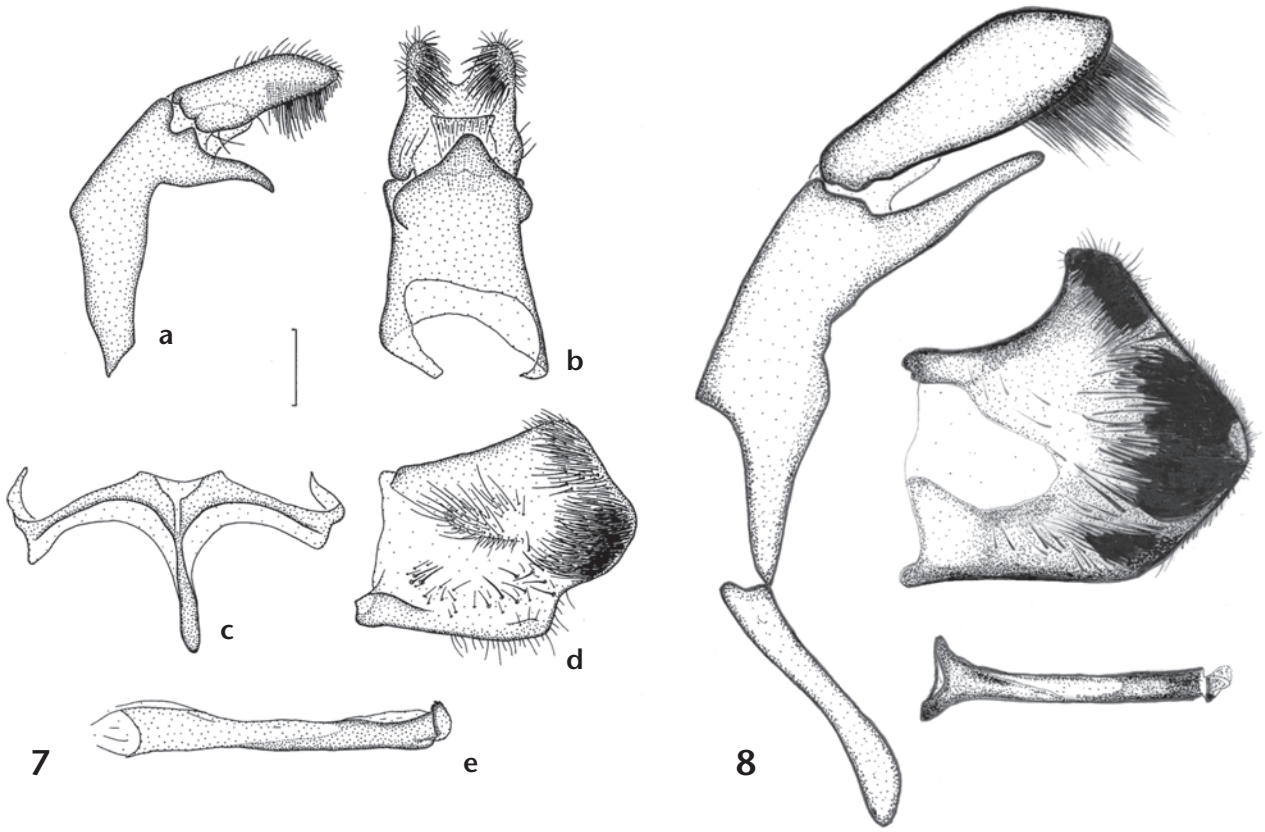

Fig. 7: *Sesia himachalensis* sp. n., ♂ genitalia, paratype (same specimen as Fig. 1), prep. ♂ AK53; **a:** Uncus-tegumen, lateral view; **b:** Uncus-tegumen, ventral view; **c:** Saccus; **d:** Right valva, ventral view; **e:** Phallus, lateral view. — **Fig. 8:** *Sesia ladakhensis,* ♂ genitalia (same data as Fig. 4, prep. CMWM, Heterocera 13797); uncus-tegumen, lateral view; right valva, ventral view; phallus, ventral view. — Scale Fig. 7 = 1 mm (Fig. 7 pinx. Kallies, Fig. 8 pinx. de Freina).

brown to orange (lemon yellow in *S. tibetensis*; brown in *S. siningensis*); tegulae fuscous (basally brown to orange in *S. siningensis* and *S. tibetensis*).

Other differences can be found in the genitalia: terminal setaceous lobe of valva large, occupying two thirds of apex (smaller in *S. siningensis*); saccus narrow (saccus strong, apically broadened in *S. siningensis*); gnathos relatively short (long in *S. tibetensis*)

S. gloriosa is known only from a single ♀, the holotype. It is very similar to both *S. siningensis* and *S. tibetensis* and may in fact be a senior synonym of one of the two.

Variability. One specimen from Lahoul has a darker ground color, the yellow pattern is paler, lacking the orange scales and the labial palps are nearly white.

Sesia ladakhensis Špatenka, 1990 comb. rev.

(Figs. 3–6, 8)

Material: Holotype ♀, Ladakh, Kargil, 2950 m, in SMFL (Fig. 3). 1 ♂, India N, Himachal Pradesh, Spiti, Spiti valley, 7 km SE Kaza, 4150 m, 3. viii. 1994 Ph., leg. P. Kautt & V. Weisz (CAK). 2 ♂♂, Nordindischer Himalaja, Himalchal Pradesh, Lahaul, Chandra-Tal, 5 km ESE Gondla, Rauling, 3150 m, 18.–22. vii. [19]98, leg. et coll. CDF (in CMWM) (genitalia on slide CMWM Heterocera 13797, fec. de Freina) (Figs. 4–6, 8).

This species was described from a single badly worn ♀ from Kargil, Ladakh, Northern India (Fig. 3). It was originally proposed in the genus *Sesia* (Špatenka & Schawaller 1990), but later, due to superficial similarity, transferred to the genus *Dasysphecia* Hampson, 1919 (Špatenka et al. 1993). At that time the genus *Dasysphecia* was considered closely related to *Sesia,* thus, belonging to the tribe Sesiini. Recently, however, Kallies & Arita (2005) clarified that *Dasysphecia* is not closely allied to *Sesia* but belongs to the tribe Cissuvorini Duckworth & Eichlin, 1977. The generic identity of *S. ladakhensis* became evident when the wing venation of the holotype was re-examined and some ♂ specimens of this species were collected by Kautt and Weisz in Spiti (Weisz 1996, unpubl.) and by one of the authors in Lahoul (de Freina, in prep.). Both wing venation and the morphology of the ♂ genitalia clearly indicated that *S. ladakhensis* belongs to the genus *Sesia*. We here provide photographs of the holotype and for the first time figure a ♂ specimen as well as genitalia and abdominal segments. Despite its unusual external appearance, the structures of the ♂ genitalia are consistent with the general morphology of the genitalia of the genus *Sesia* (compare Špatenka et al. 1999).

Remark. Although it is likely that the ♂ specimens described here do belong to *S. ladakhensis,* we cannot rule out that they belong to a different species. This is partly due to the poor condition of the holotype of *S. ladakhensis* but also to the fact that ♂♂ and ♀♀ in some species of *Sesia* are distinctly different.

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